

09/806080

SEQUENCE LISTING

<110> Jomaa, Hassan

<120> Genes of the 1-deoxy-D-xylulose biosynthesis pathway

<130> 15696

<140> PCT/EP99

<141> 1999-09-22

<150> DE19923567.8

<151> 1999-05-22

<150> DE19843279.8

<151> 1998-09-22

<160> 6

<170> PatentIn Ver. 2.1

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<213> Plasmodium falciparum

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Asn	Asp	Leu	Val	Ile	Asn	Asn	Thr	Ser	Lys	Cys	Val	Ser	Ile	Glu	Arg	
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Arg	Lys	Asn	Asn	Ala	Tyr	Ile	Asn	Tyr	Gly	Ile	Gly	Tyr	Asn	Gly	Pro	
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- 2 -

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 Ala Ile Phe Gly Ser Thr Gly Ser Ile Gly Thr Asn Ala Leu Asn Ile
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180 185 190

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195 200 205

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290 295 300

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Asp Ser Ala Thr Met Met Asn Lys Gly Leu Glu Val Ile Glu Thr His
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Phe Leu Phe Asp Val Asp Tyr Asn Asp Ile Glu Val Ile Val His Lys
325 330 335

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340 345 350

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370 375 380

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Lys Asn Gln Ile Lys Thr Glu Lys Ile Tyr Ile Lys Lys Leu Asn Arg
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Leu Ser Arg Lys Asn Ser Leu Cys Ser Ser Lys Asn Lys Ile Ala Cys
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ttg ttc gat ata gga aat gat gat aat aga aat acg aca tat ggc tat 362
Leu Phe Asp Ile Gly Asn Asp Asp Asn Arg Asn Thr Thr Tyr Gly Tyr
65 70 75
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Asn Val Asn Val Lys Asn Asp Asp Ile Asn Ser Leu Leu Lys Asn Asn
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Tyr Ser Asn Lys Leu Tyr Met Asp Lys Arg Lys Asn Ile Asn Asn Val
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Ile Ser Thr Asn Lys Ile Ser Gly Ser Ile Ser Asn Ile Cys Ser Arg
115 120 125
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Gln Cys His Thr Tyr Asn Met Ser His Glu Gln Asp Lys Leu Ala Asn
145 150 155
gat aat aat agg aat aat aaa aag aat ttt aat tta tta ttt ata aat 650
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160 165 170 175
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195 200 205
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210 215 220

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260 265 270

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340 345 350

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355 360 365

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 480 485 490 495

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 610 615 620

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 625 630 635

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 755 760 765

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 820 825 830

gat ata tat aca aat gaa atg tta aaa tat tta aag aaa gat aga aat 2666
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 835 840 845

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 865 870 875

caa cat tct gta act ttc gca gca gct atg gca atg aat aag aaa tta 2810
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 880 885 890 895

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 930 935 940

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 945 950 955

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 980 985 990

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 995 1000 1005

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- 11 -

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 Glu Asn Asn Tyr Ile Thr Lys His Asn Leu Tyr Val His Asn Ile Tyr
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tta tct aat gag cca att gaa cat gca tct ttt aag gat caa caa gaa 3674
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 1170 1175 1180

gtc gtc aaa atg gat aaa tgt agt ctt gtc aat aga att aaa aat tat 3722
 Val Val Lys Met Asp Lys Cys Ser Leu Val Asn Arg Ile Lys Asn Tyr
 1185 1190 1195

ctt aaa aat aat cct aca tgatgtaaga taaatatata tttctaaaat 3770
 Leu Lys Asn Asn Pro Thr
 1200 1205

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Asn Gln Ile Lys Thr Glu Lys Ile Tyr Ile Lys Lys Leu Asn Arg Leu
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Ser Arg Lys Asn Ser Leu Cys Ser Ser Lys Asn Lys Ile Ala Cys Leu
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Phe Asp Ile Gly Asn Asp Asp Asn Arg Asn Thr Thr Tyr Gly Tyr Asn
 65 70 75 80

Val Asn Val Lys Asn Asp Asp Ile Asn Ser Leu Leu Lys Asn Asn Tyr
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Ser Asn Lys Leu Tyr Met Asp Lys Arg Lys Asn Ile Asn Asn Val Ile
 100 105 110

Ser Thr Asn Lys Ile Ser Gly Ser Ile Ser Asn Ile Cys Ser Arg Asn
 115 120 125

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Gln Lys Glu Asn Glu Gln Lys Arg Asn Lys Gln Arg Cys Leu Thr Gln
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 Cys His Thr Tyr Asn Met Ser His Glu Gln Asp Lys Leu Ala Asn Asp
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 Asn Asn Arg Asn Asn Lys Lys Asn Phe Asn Leu Leu Phe Ile Asn Tyr
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 Phe Asn Leu Lys Arg Met Lys Asn Ser Leu Leu Asn Lys Asp Asn Phe
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 Arg Asp Ser His Lys Leu Phe Ser Gly Glu Phe Asp Asp Tyr Thr Asn
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 Tyr Tyr Lys Lys Glu Asn Ile Leu Ile Met Lys Lys Ile Leu His Tyr
 405 410 415
 Phe Pro Leu Leu Lys Leu Ile Asn Asn Pro Ser Asp Leu Lys Lys Leu
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Lys Lys Gln Tyr Leu Pro Leu Leu Ala His Glu Leu Lys Ile Phe Leu
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Ser Leu Glu Ile Gln Leu Leu Leu Tyr Ile Phe Asn Gln Pro Tyr
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Asp Asn Val Ile Tyr Asp Ile Gly His Gln Ala Tyr Val His Lys Ile
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Leu Thr Gly Arg Lys Leu Leu Phe Leu Ser Leu Arg Asn Lys Lys Gly
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Ile Ser Gly Phe Leu Asn Ile Phe Glu Ser Ile Tyr Asp Lys Phe Gly
515 520 525

Ala Gly His Ser Ser Thr Ser Leu Ser Ala Ile Gln Gly Tyr Tyr Glu
530 535 540

Ala Glu Trp Gln Val Lys Asn Lys Glu Lys Tyr Gly Asn Gly Asp Ile
545 550 555 560

Glu Ile Ser Asp Asn Ala Asn Val Thr Asn Asn Glu Arg Ile Phe Gln
565 570 575

Lys Gly Ile His Asn Asp Asn Asn Ile Asn Asn Asn Ile Asn Asn Asn
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Asn Tyr Ile Asn Pro Ser Asp Val Val Gly Arg Glu Asn Thr Asn Val
595 600 605

Pro Asn Val Arg Asn Asp Asn His Asn Val Asp Lys Val His Ile Ala
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Arg Pro Ile Gly Ser Ile Ser Asp His Leu His Tyr Phe Val Ser Asn
675 680 685

Ile Glu Ala Asn Ala Gly Asp Asn Lys Leu Ser Lys Asn Ala Lys Glu
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Asn Asn Ile Phe Glu Asn Leu Asn Tyr Asp Tyr Ile Gly Val Val Asn
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Gly Asn Asn Thr Glu Glu Leu Phe Lys Val Leu Asn Asn Ile Lys Glu
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 Ser Glu Arg Tyr Pro Asn Asn Val Tyr Asp Val Gly Ile Ala Glu Gln
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 His Ser Val Thr Phe Ala Ala Ala Met Ala Met Asn Lys Lys Leu Lys
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 Ile Gln Leu Cys Ile Tyr Ser Thr Phe Leu Gln Arg Ala Tyr Asp Gln
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 Gly Arg Ser Gly Leu Val Gly Glu Asp Gly Ala Thr His Gln Gly Ile
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 Tyr Asp Leu Ser Tyr Leu Gly Thr Leu Asn Asn Ala Tyr Ile Ile Ser
 945 950 955 960
 Pro Ser Asn Gln Val Asp Leu Lys Arg Ala Leu Arg Phe Ala Tyr Leu
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 Asp Lys Asp His Ser Val Tyr Ile Arg Ile Pro Arg Met Asn Ile Leu
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 Ser Asp Lys Tyr Met Lys Gly Tyr Leu Asn Ile His Met Lys Asn Glu
 995 1000 1005
 Ser Lys Asn Ile Asp Val Asn Val Asp Ile Asn Asp Asp Val Asp Lys
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 Tyr Ser Glu Glu Tyr Met Asp Asp Asp Asn Phe Ile Lys Ser Phe Ile
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Gly Lys Ser Arg Ile Ile Lys Met Asp Asn Glu Asn Asn Asn Thr Asn
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Glu His Tyr Ser Ser Arg Gly Asp Thr Gln Thr Lys Lys Lys Lys Val
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Cys Ile Phe Asn Met Gly Ser Met Leu Phe Asn Val Ile Asn. Ala Ile
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Lys Glu Ile Glu Lys Glu Gln Tyr Ile Ser His Asn Tyr Ser Phe Ser
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Ile Val Asp Met Ile Phe Leu Asn Pro Leu Asp Lys Asn Met Ile Asp
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Ser Asn Glu Pro Ile Glu His Ala Ser Phe Lys Asp Gln Gln Glu Val
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 Met Ser Tyr Ile Lys Arg Leu Ile Leu Phe Met
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Leu Leu Phe Tyr Ser His Val Lys Ile Lys Lys Leu Phe Ile Lys Ile
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Lys	Tyr	Cys	Glu	Cys	Thr	Lys	Lys	Tyr	Lys	Arg	Leu	Pro	Thr	Arg	Glu	
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Gln	Thr	Met	Ala	Ser	Cys	Asp	Thr	Arg	Asn	Val	Glu	Glu	Cys	Val	Tyr	
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caa	att	aga	aaa	tgt	aaa	gat	ttg	ggt	gct	gac	att	gta	agg	ttg	act	711
Gln	Ile	Arg	Lys	Cys	Lys	Asp	Leu	Gly	Ala	Asp	Ile	Val	Arg	Leu	Thr	
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Val	Gln	Gly	Val	Gln	Glu	Ala	Gln	Ala	Ser	Tyr	His	Ile	Lys	Glu	Lys	
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Leu	Leu	Ser	Glu	Asn	Val	Asn	Ile	Pro	Leu	Val	Ala	Asp	Ile	His	Phe	
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 Ile Arg Ile Gly Thr Asn His Gly Ser Leu Ser Ser Arg Val Leu Ser
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tat tat gga gat aca cca tta ggt atg gta gaa tct gct ttt gag ttt 1095
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tct aaa caa tat gaa aga aat atg atg ttc cct ata cat tta gga gtt 1239
 Ser Lys Gln Tyr Glu Arg Asn Met Met Phe Pro Ile His Leu Gly Val
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 Thr Glu Ala Gly Phe Gly Asp Asn Gly Arg Ile Lys Ser Tyr Leu Gly
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aat gaa tta aaa aat aat gaa atg gat acc aaa aat cta tta aat ttt 1479
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acc ata aaa gag tta gaa gat tct ctg caa att ttt aaa gat tta aat 1623
 Thr Ile Lys Glu Leu Glu Asp Ser Leu Gln Ile Phe Lys Asp Leu Asn
 460 465 470 475

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gat atg gtt att ata aat gat ttt cat aat ata aca aat tta gga aaa 1719
 Asp Met Val Ile Ile Asn Asp Phe His Asn Ile Thr Asn Leu Gly Lys
 495 500 505

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tat gaa cca cat aat ata gaa ttt ata gaa aaa atg gaa cca aat aat 1815
 Tyr Glu Pro His Asn Ile Glu Phe Ile Glu Lys Met Glu Pro Asn Asn
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gat aat aat aat aat aat aat aat aat aat ata tta ttt tat gtg gat 1863
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 540 545 550 555

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 575 580 585

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 Tyr Ala Gly Ser Cys Leu Met Asp Leu Met Gly Asp Gly Leu Ile Val
 655 660 665

aac gta act aat gat gtt ctt aca aat aaa aaa aag ata gaa aca aaa 2247
 Asn Val Thr Asn Asp Val Leu Thr Asn Lys Lys Lys Ile Glu Thr Lys
 670 675 680

tat gat gaa aaa gaa gaa gta gag gaa gag gga aac aat aaa gat att 2295
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 685 690 695

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att tta caa gat aca aga ata cgt tta ttt aaa aca gat tat ata gcc 2391
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720 725 730

tgc cca tct tgt gga aga act tta ttt aat ata caa gaa act act aaa 2439
Cys Pro Ser Cys Gly Arg Thr Leu Phe Asn Ile Gln Glu Thr Thr Lys
735 740 745

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Lys Ile Met Lys Leu Thr Gly His Leu Lys Gly Val Lys Ile Ala Val
750 755 760

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765 770 775

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800 805 810

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815 820

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 Thr Lys Arg Asn Thr Ile Asn Lys Ser Asp Phe Leu Tyr Ser Leu Leu
 65 70 75 80
 Asn Glu Glu Gly Asn Ser Ser Lys Lys Glu Tyr Lys Asn Leu Lys Asp
 85 90 95
 Glu Glu Lys Tyr Asn Ile Ile Gln Asn Ile Lys Lys Tyr Cys Glu Cys
 100 105 110
 Thr Lys Lys Tyr Lys Arg Leu Pro Thr Arg Glu Val Val Ile Gly Asn
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 Val Lys Ile Gly Gly Asn Asn Lys Ile Ala Ile Gln Thr Met Ala Ser
 130 135 140
 Cys Asp Thr Arg Asn Val Glu Glu Cys Val Tyr Gln Ile Arg Lys Cys
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 Lys Asp Leu Gly Ala Asp Ile Val Arg Leu Thr Val Gln Gly Val Gln
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 Glu Ala Gln Ala Ser Tyr His Ile Lys Glu Lys Leu Leu Ser Glu Asn
 180 185 190
 Val Asn Ile Pro Leu Val Ala Asp Ile His Phe Asn Pro Lys Ile Ala
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 210 215 220
 Tyr Val Asp Gly Arg Lys Lys Trp Ile Asp Lys Val Tyr Lys Thr Lys
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 Glu Glu Phe Asp Glu Gly Lys Leu Phe Ile Lys Glu Lys Phe Val Pro
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 260 265 270
 Asn His Gly Ser Leu Ser Ser Arg Val Leu Ser Tyr Tyr Gly Asp Thr
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 Pro Leu Gly Met Val Glu Ser Ala Phe Glu Phe Ser Asp Leu Cys Ile
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325 330 335
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 Gly Asp Asn Gly Arg Ile Lys Ser Tyr Leu Gly Ile Gly Ser Leu Leu
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 385 390 395 400
 Arg Ile Phe Tyr Asn Glu Asn Phe Lys Glu Asp Asn Glu Leu Lys Asn
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 Asn Glu Met Asp Thr Lys Asn Leu Leu Asn Phe Glu Glu Asn Tyr Arg
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 Leu His Glu Glu Cys Thr Ile Gly Asn Val Val Thr Ile Lys Glu Leu
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 Glu Asp Ser Leu Gln Ile Phe Lys Asp Leu Asn Leu Glu Val Asp Ser
 465 470 475 480
 Asn Gly Asn Leu Lys Lys Gly Ala Lys Thr Thr Asp Met Val Ile Ile
 485 490 495
 Asn Asp Phe His Asn Ile Thr Asn Leu Gly Lys Lys Thr Val Asp Lys
 500 505 510
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 565 570 575
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 Glu Leu Asn Arg Arg Pro Leu Phe Ile Leu Leu Lys Ser Asp Asn Ile
 595 600 605
 Tyr Glu His Val Leu Ile Thr Arg Arg Ile Asn Glu Leu Leu Gln Ser
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 Leu Asn Ile Asn Ile Pro Tyr Ile His Tyr Val Asp Ile Asn Ser Asn
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Asn Tyr Asp Asp Ile Leu Val Asn Ser Thr Leu Tyr Ala Gly Ser Cys
 645 650 655

Leu Met Asp Leu Met Gly Asp Gly Leu Ile Val Asn Val Thr Asn Asp
 660 665 670

Val Leu Thr Asn Lys Lys Lys Ile Glu Thr Lys Tyr Asp Glu Lys Glu
 675 680 685

Glu Val Glu Glu Glu Gly Asn Asn Lys Asp Ile His Arg Leu Leu Ser
 690 695 700

Arg Val Ala Leu Asn Ser Phe Leu Thr Leu Asn Ile Leu Gln Asp Thr
 705 710 715 720

Arg Ile Arg Leu Phe Lys Thr Asp Tyr Ile Ala Cys Pro Ser Cys Gly
 725 730 735

Arg Thr Leu Phe Asn Ile Gln Glu Thr Thr Lys Lys Ile Met Lys Leu
 740 745 750

Thr Gly His Leu Lys Gly Val Lys Ile Ala Val Met Gly Cys Ile Val
 755 760 765

Asn Gly Ile Gly Glu Met Ala Asp Ala His Phe Gly Tyr Val Gly Ser
 770 775 780

Ala Pro Lys Lys Ile Asp Leu Tyr Tyr Gly Lys Glu Leu Val Glu Arg
 785 790 795 800

Asn Ile Pro Glu Glu Glu Ala Cys Asp Lys Leu Ile Glu Leu Ile Lys
 805 810 815

Lys His Asn Lys Trp Lys Asp Pro
 820

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